

# Effect of Route Delivery Speed on Firm Performance of Eldoret Dola Manufacturers.

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descriptive research design. The target population for this study was 155 employees from Dola Manufacturer Company. Sample size for this was obtained using Israel formulae to get a sample size of 111 respondents. Simple random sampling was used to collect data from 111 respondents in Dola Manufacturer Company. The study used questionnaire as its main data collection tool. Pilot study was used to ascertain validity and reliability of the research instruments; the researcher piloted research instruments in Unga limited Eldoret. The study employed the use of a content validation measure. Quantitative data collected was analyzed by use of descriptive statistics to generate percentages, means, standard deviations, frequencies and inferential statistics using correlation and regression model. Charts and tables were used to present the data collected for ease of understanding and analysis. The study findings route delivery speed has a positive and statistically significant effect on firm performance of Eldoret Dola Manufacturers ( $\beta=0.489$ ;  $p<0.05$ ). The study findings will help the managers of the company in planning the route on distribution of the products so as to compete favorably in the market. The findings were significant in such that other cereal milers companies might share the information from the study which is useful in leading the management team in the strategic planning. Researchers benefited from the study since the study results and the findings serves as the literature for the future scholars.

### Introduction

Firm performance is defined as both behavior and results; this definition covers the achievement of expected levels as well as objective setting and review (Katzenbach & Smith, 2015). The underlying thought behind the study is to seek the relationship bearing in mind that if the behavior of management is right, then the expected levels of output was achieved success and vice versa for failure. Success and failure are taken as the two ends of the performance continuum (Linder & Sperber, 2017). Firm performance comprises the actual output or results of firm measured against its intended outputs (Ngui, 2015). Whereas the definitions may differ between the authors, they are in agreement that firm performance is about achieving superior results and/or achievement of objectives.

### Abstract

Firm performance is an organization's ability to meet its goals given the limited resources within its disposal. Most producing firms in Kenya rely on importation of raw materials machinery, spare components, and typically specialized labor. Therefore, the main aim of this study was to find out the effect of supply route planning on performance of supply chain management of Dola Manufacturers. This study adopted theory of constraints, game theory and survival-based theory. This study adopted

There are three different levels of performance within firms which include financial performance, firm performance and organization effectiveness, although the latter has been subsequently known as firm performance (Ombongi, 2017). All these three levels are affected by supply route supply route planning in different ways depending on the operation cost, speed of products on transits and security of goods on transits. In the world across, no matter how long or short a supply route may be, being prepared is a significant factor in risk reduction. By supply route planning, companies and their drivers was able to predict hazardous aspects of road design, approach to customers' premises. Alternative, safer supply routes and times may be considered and thus potentially avoid incidents (Hakonsson, 2015).

Globally, in Iran road transport dominates other modes of transportation in the movement of

passengers and goods. This is because; road transportation has numerous advantages over and above other modes of transport. The Roles of strategic supply route planning in transportation are the organizational environment in which strategic supply route planning is applied (contextual), and how strategic supply route planning is designed and implemented. Over the years, 70% Iranian depended on public transport for their mobility; this has led to an acute shortage of public transport (Burton, 2015). In the Netherlands, the concept 'safe traffic' is the leading vision in road safety policy and research. The main goal of a sustainably safe road transport system is to reduce the annual number of road crash casualties to a fraction of the current levels (Grant, 2016). Important requirements following from this vision are that journeys should follow safe roads as much as possible, should be as short as possible, and the quickest and the safest supply route should coincide. This report focuses on the development of a method which enables the planner to find out the safety effects of existing supply route choices, and also of changes in supply route choice. Road safety can be described in various ways. It has previously been shown that micro-simulation models are a suitable aid for supply route choice studies (Grant, 2016).

In India, firm performance is required in clarifying the multidimensional relationship between supply chain management (SCM) practices and firm performance. The notion of firm performance has many aspects, and each aspect has been operationalized in various ways in previous supply chain management studies. Financial metrics have served as a tool for comparing organizations and evaluating an organization's behavior over time (Flynn, Huo & Zhao, 2010) reveal that operational performance and business performance are the two most utilized measures of firm performance.

In Africa, Ghana supply route planning provides the basic direction and rationale for determining the focus of an organization; and also provides the specification against which any organization may best decide what to do and how to do it (Bryson, 2018). Simply put, it is a process for creating and describing a better future in measurable terms and the selection of the best means to achieve the results desired. It is important to note that not all supply route planning is actually strategic even though they may be termed so. It is said that failure to plan leads to supply route planning to fail. Strategic supply route planning standardizes the processes of goal/objective setting, situation analysis, alternative consideration, implementation and evaluation that enable an organization to attain its goals and objectives (Choi, Kim & Noh, 2015).

In Kenya, supply route planning is essential in any organization since it's an organizational management activity that is used to achieve goals, focus energy and resources, strengthen operation and ensures that employees and other stakeholders are working towards the common goals in much achievable way (Santos, Pache & Birkholz, 2015). The supply route planning helps to assess and adjust the organization's direction in response to a changing environment. For an organization to achieve effective performance there has to be well defined strategic plans that are consciously communicated to all stakeholders to be effectively implemented (Lawrence, 2015).

Dola Company started in a small hut a few years ago in 2008. They saw the need to provide world class strategies to startups and SME's that comprise a majority of local companies. They have grown with the times and most of their clients have become Course books, adapt, syllabus, local needs, teacher practices big boys in their industries (Evans, 2018). Creating a brand experience that connects with customers and the world. This is their passion. After understanding most important need, they work the magic needed to answer brief. The process they work with is designed to deliver creative work on target and on time. Design Village offers integrated end-to-end marketing (Lee, 2012). The company provides 360° execution across all platforms. The teams in different departments are experienced brand thinkers and talented creative who ensure brand grows. Strategy; the team conducts an audit of brand and target market in order to offer consultancy and create campaigns that get products noticed; Brand Management & Strategy; Communication & Media Route planning; Below The Line and the Digital & Social Media.

Dola Company has experienced good and bad supply route planning cases over several years. The performance of the company has been changing over the years but for the last three years. The management committee has established a well-designed supply route that enables the transit of both raw materials to the company and the company products to the retailers. The logistics department has addressed the problem but still there are some other challenges that still hamper the smooth supply chain management (Lam, 2012). Thus this study sought to establish effect of supply route planning on firm performance of Dola Manufacturer Company.

#### **Statement of the Problem**

Firm Performance is an organization's ability to meet its goals given the limited resources within its disposal (Bryson, 2018). In the wake of high labor

costs, increasing customer demands and tight budgets, the need for efficient production and timely order fulfillment is more important than ever. The notion of firm performance has many aspects, and each aspect has been operationalized in various ways in previous supply chain management studies. The early attempts of empirical research in SCM have been limited at developing instruments capable of measuring SCM practices. Karimi & Rafiee (2014) observed that most recently, some researchers have focused their research efforts into exploring the relationship between practices of SCM and organizational performance. They have used financial and market criteria to operationalize organizational performance (return on investment, market share, profit margin on sales, the growth of return on investment, the growth of sales and the growth of market share).

Most producing firms in Kenya rely on importation of raw materials machinery, spare components, and typically specialized labor. This suggests that these firms are affected heavily by fluctuation of exchange rates and inflation within the country. This is because of unreliable working system brings the compensatory damage that impact negatively on the financial performance of the organization (Myers, 2000). This results to significant reduction of employee's productivity, increased labor conflicts, dissatisfaction and perception of unfairness in the organization (Ongori & Agolla, 2008). Unga Group has ceased some of its operations due losses for three years in a row, with the miller saying it is reviewing its business model in that market. This operation center lost Sh118.9 million in a year, contributing to the parent company's slip into a net loss of Sh32.2 million from a net profit of Sh508.8 million a year earlier. Bad debt provisions and local currency depreciation against the US dollar significantly worsened its performance (Schroeder, 2015).

Poor firm performance is also thought to be affected by supply route planning (Robert & Wally, 2003). This is because supply route planning has been the major challenge for Kenyan companies such as Dola performance over several years. Supply route planning is a process for charting the general direction of organization distribution of the products and it defines strategies the organization will use to reach its goals which are a challenge. Because no organization has unlimited resources, managers experience problems deciding which alternative strategies will benefit the firm, thus the game plan to achieve set goals (Keller, 2011). Some prior studies have indicated that strategic supply route planning results in inferior financial performance, thus critical to analyze the relationship between supply route planning and firm performance (Rudd, 2008). The

distribution of the products has faced a number of challenges for example track breakdown, theft cases, shortage of petrol along the way, poor coordination with the retailers, communication problem, flooding during rainy season and other challenges that slows down the general performance of the company (Mwase, 2003).

There are several positive and negative effects of routine supply route planning on firm performance (Green & Bochtis, 2013). For example the firm performance will increase over a period of time due to standardized supply route schedules that serves to reach many retail consumers without failing daily; the precautionary measures will always be underway to avoid dangerous supply routes as well as good communication was maintained to keep the work easy for deliveries (Kamal, 2004). However, supply route planning at Dola limited has led to increased operational cost, reduced delivery speed, route insecurity on firm performance of goods on transit of the supply chain; this has led to its sluggish growth in the last few years. Dola Company has experienced good and bad supply route planning cases over several years. The performance of the company has been changing over the years but for the last three years. This therefore sought the study to research on the effects of supply route planning on performance of Dola Manufacturers.

### **Objective**

The objective of the research was to establish the effect of route delivery speed on firm performance of Eldoret Dola Manufacturers

### **Research Hypothesis**

**H<sub>01</sub>:** There is no statistical significant effect of route delivery speed on firm performance of Eldoret Dola Manufacturers.

### **Literature Review**

#### **Theoretical Framework**

This study adopted Game theory, theory of constraint and survival based theory to understand the theory behind effects of route planning on firm performance.

#### **Theory of Constraints**

The Theory of Constraints as proposed by Eliyahu in 2000 is a methodology for identifying the most important limiting factor (for example constraint) that stands in the way of achieving a goal and then systematically improving that constraint until it is no longer the limiting factor. The Theory of Constraints takes a solving approach to improvement. It hypothesizes that every complex system, including transportation processes, consists of multiple linked activities, one of which acts as a

constraint upon the entire system (for example the constraint activity is the “weakest link in the chain”). The Theory of Constraints provides a powerful set of tools for helping to achieve that goal, including: the Five Focusing Steps (a methodology for identifying and eliminating constraints), The Thinking Processes (tools for analyzing and resolving problems) and Through put Accounting (a method for measuring performance and guiding management decisions) (Eliyahu, 2000).

The underlying assumption of the theory of constraints is that organizations can be measured and controlled by variations on three measures: throughput, operational expense, and inventory. Inventory is all the money that the system has invested in purchasing things which it intends to sell. Operational expense is all the money the system spends in order to turn inventory into throughput. Throughput is the rate at which the system generates money through sales (Izmailov, 2014).

Before the goal itself can be reached, necessary conditions must first be met. These typically include safety, quality, and legal obligations. For most businesses, the goal itself is to make money. However, for many organizations and non-profit businesses, making money is a necessary condition for pursuing the goal. Whether it is the goal or a necessary condition, understanding how to make sound financial decisions based on throughput, inventory, and operating expense is a critical requirement (Izmailov, 2014).

Criticisms that have been leveled against TOC include: Claimed sub optimality of drum-buffer-rope While TOC has been compared favorably to linear programming techniques, Trietsch (2005) argues that DBR methodology is inferior to competing methodologies. Linhares and Brum, (2009), has shown that the TOC approach to establishing an optimal product mix is unlikely to yield optimum results, as it would imply that  $P=NP$ . Johnson, Creasy and Fan (2016) indicated that TOC borrows heavily from systems dynamics developed by Forrester in the 1950s and from statistical process control which dates back to World War II. Goldratt has been criticized on lack of openness in his theories, an example being him not releasing the algorithm he used for the Optimum Performance Training system (Nieminen, 2014). Some view him as unscientific with many of his theories, tools and techniques not being a part of the public domain, rather a part of his own framework of profiting on his ideas. According to Gupta and Snyder (2009), despite being recognized as a genuine management philosophy nowadays, TOC has yet failed to demonstrate its effectiveness in the academic

literature and as such, cannot be considered academically worthy enough to be called a widely recognized theory. TOC needs more case studies that prove a connection between implementation and improved financial performance.

Nave (2002) argues that TOC does not take employees into account and fails to empower them in the production process. He also states that TOC fails to address unsuccessful policies as constraints. In contrast, Mukherjee and Chatterjee (2007) state that much of the criticism of Goldratt's work has been focused on the lack of rigour in his work, but not of the bottleneck approach, which are two different aspects of the issue.

The theory is highly applicable in the implementation of the route planning as the Theory of Constraints is a methodology for identifying the most important limiting factor (for example constraint) that stands in the way of achieving best route planning in the firm and then systematically identifying and eliminating the constraint towards enhancing performance. The route planning identifies the constraints some of the constraints to include inefficiencies and injuries. The route planning management system gives a company the benefits of lower costs, increased efficiencies, fewer injuries, maximum sustainable returns on operating assets, and an enhanced competitive position (Jeronimo, Antunes & Filho, 2016).

## **Empirical Review**

### **Supply Route Delivery Speed**

Route delivery speed is the speed used to deliver or distribute goods from one destination to another using specific route (Christiansen, Fagerholt, Nygreen, & Ronen, 2013). Delivery speed is the principal source of flexibility in sales. Order backlog forms a large part of delivery time. Procurement is based on the production plan, which, in turn, is based on orders. Typically, the fixed period in production is long. In project deliveries, the exact delivery time, as well as the product configuration, may change several times.

Hines (2012) study postulated the relationship of delivery speed of products and firm performance of the manufacturing firms in Kenya. The study adopted three organizational theories that were examined to understand how companies adopt and develop best route plan. The three theories were resource advantage, dynamic capabilities and stakeholder theories. This study used descriptive and cross-sectional survey design. This study employed proportionate stratified random sampling technique. Data for this study was obtained from primary sources. The principal data was collected through

organized questionnaire. Regression modeling was used to estimate the relationship between delivery speed of products and firm performance. The results indicated that closed loop in the manufacturing firms positively and significantly influenced delivery speed in the logistic firms. This indicated that increase in closed loop supply chain management in the manufacturing firms led to improved delivery speed. The study however established that both joint venture and third party logistics did not have significant effect on delivery speed.

Elbert, Thiel & Reinhardt, (2016) studied on chain delivery performance models based on the concept of the delivery window, which is defined as the difference between the earliest acceptable delivery date and the latest acceptable delivery date. The supply chain delivery performance is evaluated from a supplier's and a buyer's prospective. Optimally positioning the delivery window minimizes the expected penalty cost due to early and late delivery. The conditions for the optimal position of the delivery window are derived for the general form of a delivery time distribution. The study investigated how the timeliness of the delivery will affect the inventory cost structure of a buyer in a two stage supply chain. From the perspective of the buyer, untimely delivery can impact inventory holding and stock out costs. The study formulate the supply chain delivery window problem as a stochastic model with three possible delivery outcomes (early, on time, and late delivery) and integrate this feature with an inventory model with two levels of storages (owned warehouse and rented warehouse).

Anderson, Coltman, Devinney & Keating (2011) presented empirical evidence on the importance of delivery performance in the selection third party logistics providers. Boon-itt and Wong (2011) investigated the effect of uncertainties on the relationships between supply chain integration and customer delivery performance. Golini and Kalchschmidt (2010) addressed the relationship between globalization of sales, investments in supply chains and delivery performance.

Silveira (2007) showed that the timeliness of delivery is a key concern to customers. Lastly, several researchers have examined the relationship between delivery performance and supply chain operations. Delivery performance provides an indication of how successful the supply chain is at providing products and services to the customer. This metric is most important in supply chain management as it integrates the measurement of performance right from supplier end to the customer end. Present research is focused on a case study

conducted in a leading batteries manufacturing firm in South India and analysis of elemental performances in overall delivery performance of an entire supply chain in an integrated approach.

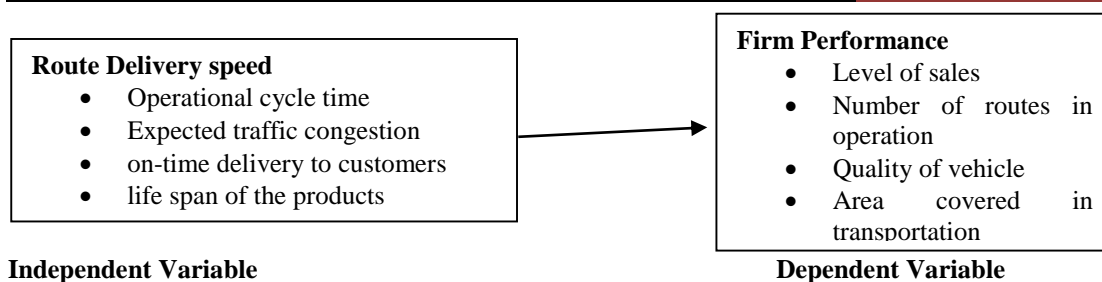
Gligor & Holcomb (2012) examined the relationship between agility, adaptability and leanness in terms of their overall purpose and characteristics. Agility and adaptability have been investigated by analyzing survey data on strategy and performance, collected from major Japanese companies. Performance measures such as set up time, operational cycle time, variety of products that can be offered, procurement lead time, on-time delivery to customers, delivery lead time and speed of new product development have been analyzed under four process categories: operational processes, supply processes, order fulfillment processes and product development processes.

Garg, Narahari and Viswanadham (2014) argued that the supply chain process is complex, comprising a hierarchy of different levels of value delivering business processes. Achieving superior delivery performance is the primary objective of any industry supply chain. As the number of resources, operations and organizations in supply chain increases, variability destroys synchronization among the individual processes, leading to poor delivery performance. In an integrated supply chain, coordination of logistical activities is effectively extended to encompass source, make and deliver processes in collaboration with channel partners and suppliers. Intra firm coordination of sourcing, production and logistics activities enhances the ability to respond to market volatility by eliminating redundant activities and reducing response time by facilitating seamless flow of demand information, supply of materials and finished goods.

Garg *et al.*, (2014) presented a novel approach to achieve variability reduction, synchronization and hence improved delivery performance in supply chain networks using Variance Pool Allocation problem to a linear Make-To-Order (MTO) supply chain with 'n' stages. Also, the research in the field of logistics provided technology-driven solution to the distribution systems in terms of high delivery reliability, customer satisfaction and quick response.

### **Conceptual Framework**

Conceptual framework shows the relationship between independent variables which are operation cost, delivery speed and security of route planning. The dependent variable was firm performance.



### Measurement of Variables

This section presented how dependent and independent variables were measured in the study.

#### Independent variables

Independent variable was route delivery speed which was measured using operational cycle time from manufacturer to customer's destination, expected traffic congestion along the chosen route of goods on transit, on-time delivery of goods to the customers and life span of the products on transit.

#### Dependent variable

The dependent variable for the study was firm performance which was measured using frequency of safe arrival of products, arrival of products on time and wide area covered in transportation

### Research Methodology

#### Research Design

Research design is a plan for collecting and utilizing data so that desired information can be obtained with sufficient precision (Miles & Huberman, 2004). This study adopted descriptive research design. This is due to the fact that the study sought to have an accurate description of the study variables and also study the relationship between the aforesaid variables.

#### Population of the Study

The target population refers to the group of people or study subjects who are similar in one or more ways and which forms the subject of the study in a particular survey (Orodho, 2003). Therefore the accessible population for this study was employees of Dola Manufacturer Company in Eldoret town Uasin Gishu County.

**Table 3.1 Target Population**

| Target Group         | Target Size |
|----------------------|-------------|
| Transport managers   | 2           |
| Operational managers | 8           |
| Sales persons        | 60          |
| Drivers              | 40          |
| Drivers assistants   | 45          |
| Total                | 155         |

### Sample Size and Sampling Procedure

Sample size refers to the number of observations or replicates to include in a statistical sample (Orodho, 2003). Sampling technique refers to a procedure of selecting a part of population on which research can be conducted, which ensures that conclusions from the study can be generalized to the entire population. The researcher obtained sample size using Israel (1992).

$$n = \frac{N}{1 + N(e)^2}$$

Where n is the sample size required

N is the population size =155

e is the level of precision =0.05

$$n = \frac{155}{1 + 155(0.05)^2}$$

$$n = 111$$

**Table 3.2 Sample Size**

| Target Group       | Proportion | Sample Size |
|--------------------|------------|-------------|
| Transport managers | 2/155*111  | 1           |

|                      |                    |            |
|----------------------|--------------------|------------|
| Operational managers | 8/155*111          | 6          |
| Sales persons        | 60/155*111         | 43         |
| Drivers              | 40/155*111         | 28         |
| Drivers assistants   | 45/155*111         | 33         |
| <b>Total</b>         | <b>155/155*111</b> | <b>111</b> |

Stratified sampling was used to select respondents for the study. After stratification of sample respondent's simple random sampling was done on sales persons, drivers, driver's assistants and customers. This sampling technique was used in order to avoid biasness because all the respondents have required information.

### Data Collection Instruments

The study used questionnaire as its main data collection tool. The structured questionnaire started with an introductory request followed by items which are subdivided into three parts. Part 1 is set to capture personal information of the respondents such as gender, age, education level and how many times he/she have been employed at Dola Company; part 2 was set to capture items on specific objectives; operation cost, delivery speed, security of goods on transit and effectiveness on performance of supply chain in Dola Eldoret Manufacturers. Part 3 was set to capture items on firm performance chain. The items are Likert type with a scale of 1 to 5. The highest degree was marked with the most positive choice from the alternatives while the least score was awarded to the most negative choice. Likert scale for which 5-Strongly Agree, 4-Agree, 3-Undecided, 2-Disagree and 1-Strongly Disagree.

### Pilot Study

Pilot study was used to ascertain validity and reliability of the research instruments; the researcher piloted research instruments in Unga limited Eldoret. The respondents in pilot study represented 10% of the target sample (MacKinnon *et al.*, 2016). The results of the piloted research instruments were analyzed to test the reliability and validity of the research tools.

### Validity

Validity of the research instruments was achieved by using understandable language free from jargon to make it easily understood by the respondents. Research instruments were available to the supervisors and other specialized lecturers for validation before carrying out the field study for real data collection. According to May (2011) the researcher needs to seek the opinion of individuals who can render intelligent judgment about their adequacy.

The study employed the use of a content validation measure, which is usually subjective, thorough and representative of the wider body of material that the research is trying to assess. In order to determine content validity for quantitative data, the researcher obtained the ratio of the number of items rated as relevant per objective to that of the total number of items in the questionnaire. When converted into percentage, a value greater than 50% validates the instrument (Creswell & Creswell, 2017).

### Reliability

Reliability is the consistency of measurement, or the degree to which an instrument measures the same way each time it is used under the same condition with the same subjects. A measure is considered reliable if a person's score on the same test given twice is similar. Reliability does not, however, imply validity because while a scale may be measuring something consistently, it may not necessarily be what it is supposed to be measuring. The researcher will use the most common internal consistency measure known as Cronbach's alpha ( $\alpha$ ). The recommended value of 0.7 was used as a cut-off of reliabilities. Cronbach's alpha is a general form of the Kuder-Richardson (K-R) 20 formula used to access internal consistency of an instrument based on split-half reliabilities of data from all possible halves of the instrument.

### Data Processing and Analysis

Quantitative data collected was analyzed by use of descriptive and inferential statistics. Descriptive statistics was percentages, means, standard deviations and frequencies while inferential statistics was correlation and multiple regressions. This was done by tallying up responses, computing percentages of variations in response as well as describing and interpreting the data in line with the study objectives and the assumptions. Tables and other graphical presentations as appropriate were used to present the data collected for ease of understanding and analysis. Data was analyzed using Statistical Package for Social Scientists (SPSS). A regression was done and the results obtained were interpreted using tables and figures for ease of understanding. The following regression model was used:

$$Y = \beta_0 + \beta_1 x_1 + \epsilon \dots \dots \dots \text{Equ. 3.1}$$

Where: Y represents firm performance chain

$\beta_0$  represent the intercept when x is zero

$X_1$  represent route delivery speed  
 $\varepsilon$  represents error term

## Research Findings and Discussion

### Response Rate

The study sample size was 111 respondents and the study collected data from 105 respondents. Therefore the respond rate was 94.6%. In making conclusions for the study this response rate was

satisfactory as per Mugenda and Mugenda (1999). The response rate was representative, a 50% response rate is adequate for analysis and reporting; a rate of 60% is good and a response rate of 70% and over is excellent. The response rate was considered to be excellent, based on the assertion. The data collected was, therefore, valid for analysis and generalization.

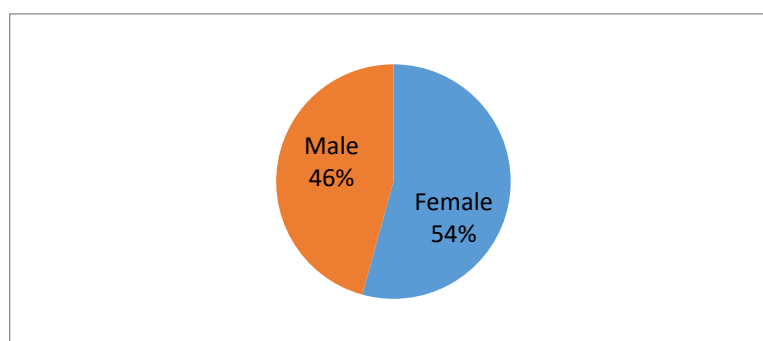
**Table 4.1 Respond Rate**

|              | Population | Percentage |
|--------------|------------|------------|
| Administered | 111        | 100        |
| Responded    | 105        | 94.6       |

### Gender of Respondents

The study sought to determine the gender of respondents and the results were as shown in figure 4.1. The study findings indicated that on the respondents' gender, female had the higher

percentage of 57(54.0%) followed by male with 48(46.0%). This showed that the study was not biased and the information was reliable for the study findings.



**Figure 4.1 Gender of Respondents**

### Age of Respondents

The study sought to determine age of respondents and the results were as shown in table 4.2. The study carried out by the researcher showed that the majority of respondents fall under the age of 21–30

years with 68(64.8%); followed by below 21 years with 30(28.6%); 31-40 years with 5(4.8%) and lastly above 40 years with 2(1.9%). The findings indicated that the data collected were reliable because the information was collected from all the age brackets.

**Table 4.2 Age Brackets of the Respondents**

|       | Age Brackets        | Frequency  | Percent      |
|-------|---------------------|------------|--------------|
| Valid | Below 21years       | 30         | 28.6         |
|       | Between 21-30 years | 68         | 64.8         |
|       | Between 31-40 years | 5          | 4.8          |
|       | Over 40 years       | 2          | 1.9          |
|       | <b>Total</b>        | <b>105</b> | <b>100.0</b> |

### Level of Education

The study sought to determine level of education of respondents and the results were as indicated in table 4.3. The majority of respondents in level of education proved that they had reached diploma

level with 67(63.8%), followed by degree level by 15(14.3%) and finally masters level by only 15(14.3%) of the respondents. This implied that respondents were educated and they provided reliable information on the questions asked.

**Table 4.3 Level of Education**

| Level of Education |              | Frequency  | Percent      |
|--------------------|--------------|------------|--------------|
| Valid              | Ph.D         | 8          | 7.6          |
|                    | Masters      | 15         | 14.3         |
|                    | Degree       | 15         | 14.3         |
|                    | Diploma      | 67         | 63.8         |
|                    | <b>Total</b> | <b>105</b> | <b>100.0</b> |

### Working Duration

The study sought to determine working duration of respondents and the results were as indicated in table 4.4. From table 4.4 above, majority of the respondents had worked for 5 to 10 with 12(11.4%) followed by those who had worked for 10 to 15 years

with 51(48.6%), those who had worked for 0 to 5 years were 9(8.6%) and finally respondents who had worked for more than 16 years were 33(31.4%). This implied that the informants had good knowledge on the questions that were asked since majority of them had experience in the company.

**Table 4.4 Work Period of Respondents**

| Work Period |                     | Frequency  | Percent      |
|-------------|---------------------|------------|--------------|
| Valid       | Between 0-5 years   | 9          | 8.6          |
|             | Between 5-10 years  | 12         | 11.4         |
|             | Between 10-15 years | 51         | 48.6         |
|             | 16 and above        | 33         | 31.4         |
|             | <b>Total</b>        | <b>105</b> | <b>100.0</b> |

### Findings of Descriptive Statistics

In this section, the study analyzes the specific objectives of the study regarding the effect of supply route planning on performance of Dola Manufacturers. These specific objectives relate to route operation cost, delivery speed and security of route.

### Delivery Speed

The study sought to investigate the effect of route delivery speed on firm performance of supply chain management. The results were analyzed in the table 4.6.

The study findings on the effect of route delivery speed on firm performance of supply chain management showed that majority of respondents agreed that operational cycle time enhances the delivery speed of products to customers (Mean=4.10; Std. Dev=1.12). The study findings also revealed that majority of respondents agreed that expected traffic congestion on chosen route may slow the delivery speed of products (Mean=4.19; Std. Dev=1.17). The study results further indicated that majority of respondents agreed that chosen route ensures on time delivery of goods to customer (Mean=3.71; Std. Dev=1.34). Lastly the study results revealed that majority of respondents agreed with the statement that life spend of the product determine the delivery speed to the customers (Mean=4.17; Std. Dev=1.17).

The findings of the study revealed that majority of the respondents were of the opinion that expected traffic congestion on chosen route may slow the delivery speed of products. This implies that traffic congestion costs commuters, not taking into account things like deadlines, especially if your supply chain relies on trucks that are currently stuck in traffic. If commuters alone are wasting this much money in traffic, the cost of congestion for delivery truck is undoubtedly higher. These study findings agreed with study by Bushuev (2016) who indicated that optimally positioning the delivery window minimizes the expected penalty cost due to early and late delivery. The conditions for the optimal position of the delivery window are derived for the general form of a delivery time distribution. From the perspective of the buyer, untimely delivery can impact inventory holding and stock out costs. The study formulate the supply chain delivery window problem as a stochastic model with three possible delivery outcomes (early, on time, and late delivery) and integrate this feature with an inventory model with two levels of storages (owned warehouse and rented warehouse).

**Table 4.6 Effect of route delivery speed on firm performance**

|   | N   | Mean   | Std. Dev | Min  | Max  |
|---|-----|--------|----------|------|------|
| Operational cycle time enhances the delivery speed of products to customers         | 105 | 4.1048 | 1.11738  | 1.00 | 5.00 |
| Expected traffic congestion on chosen route may slow the delivery speed of products | 105 | 4.1905 | 1.16928  | 1.00 | 5.00 |
| Chosen route ensures on time delivery of goods to customers                         | 105 | 3.7143 | 1.34246  | 1.00 | 5.00 |
| Life spend of the product determine the delivery speed to the customers             | 105 | 4.1714 | 1.17225  | 1.00 | 5.00 |

### Firm Performance

The study sought to find out firm performance. The results were analyzed in the table 4.8. The study findings on the on firm performance showed that majority of respondents agreed that choosing secure route ensure safe arrival of products to destination hence high level of sales (Mean=4.33; Std. Dev=1.17). On the statement that delivery speed has enhanced the number of routes in operation in Dola company majority of respondents agreed (Mean=4.38; Std. Dev=1.05). The study findings also shows that majority of respondents agreed that the quality of vehicle used by Dola has enhanced the performance of the firm. Lastly the results revealed that majority of respondents agreed that choosing

the shortest, safe with reduced route operations cost enhances wide coverage in transportation on time arrival of products.

The study findings revealed that majority of the respondents were of the opinion that choosing secure route ensures safe arrival of products to destination hence high level of sales.

The study findings concur with Prajogo (2013) findings which indicated that it's important that staff employed by route security on firms performance to be of good academic standing and be consistently part of the firms cultures through controlled or steady staff turnover. In the same argument, it is logical to suggest that attention needs to be paid to the nature of this resource and its management as this will impact on route security and performance

and consequently the performance of the organization indeed

**Table 4.8 Firm performance**

|   | N   | Mean   | Std. Dev | Min  | Max  |
|---|-----|--------|----------|------|------|
| Choosing secure route ensure safe arrival of products to destination hence high level of sales                                      | 105 | 4.4381 | 1.11738  | 1.00 | 5.00 |
| Delivery speed has enhanced the number of routes in operation in Dola company   | 105 | 4.3810 | 1.05958  | 1.00 | 5.00 |
| The quality of vehicle used by Dola has enhanced the performance of the firm  | 105 | 4.3333 | .94733   | 1.00 | 5.00 |
| Choosing the shortest, safe with reduced route operations cost enhances wide coverage in transportation on time arrival of products | 105 | 4.0667 | 1.25013  | 1.00 | 5.00 |

### Findings of Inferential Statistics

This section presented the results of inferential statistic which were correlation analysis and regression analysis. Correlation analysis was done in this study to establish the relationship between route operation cost, route delivery speed, route security and firm performance. The established relationship was further explained.

### Correlation Analysis

Correlation analysis was performed to establish the relationship between route operation cost, route

delivery speed, route security and firm performance. The correlation analysis results were presented in Table 4.9 below. The study findings further revealed that moderately route delivery speed affect positively and statistically significant firm performance of Dola company (0.486,  $p < 0.01$ ). This implies that route delivery speed affects the performance of Dola Company by reducing the time for goods in transit to arrive to destination hence reduce the transport cost.

**Table 4.9 Correlations**

|                      | Route speed | Delivery | Firm Performance |
|----------------------|-------------|----------|------------------|
| Route Delivery speed | 1           |          | .486**           |
| Firm Performance     | .486**      | 1        |                  |

### Multiple Regression Model of Supply Route Planning on Firm Performance

The multiple regression analysis models the relationship between the dependent variable firm performance and independent variables route operation cost, route delivery speed, route security. The results are shown in table 4.10, table 4.11 and table 4.12.

Table 4.12 shows the coefficient of determination

( $R^2$ ) and correlation coefficient (R) shows the degree of association between supply routes planning on firm performance in Dola Company. The study results shows that that  $R^2 = 0.317$  and  $R = 0.563$ . The value of R implies that there is a linear relationship between supply routes planning on firm performance in Dola Company. The  $R^2$  shows that explanatory power of the independent variables is 0.317. This implies that about 31.7% of the variation in supply routes planning is explained by the regression model.

**Table 4.10 Model Summary of Route delivery speed on Firm Performance**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|-------|-------------------|----------|-------------------|----------------------------|---------------|
| 1     | .563 <sup>a</sup> | .317     | .297              | .63249                     | 1.189         |

F test shows the overall test of significance of the fitted regression model. The study findings in table 4.11 indicate that the F-statistics was 15.627 and significant at  $p=0.05$  hence confirming that the regression model was fit.

**Table 4.11 ANOVA of Route delivery speed on Firm Performance**

| Model |            | Sum of Squares | df  | Mean Square | F      | Sig.              |
|-------|------------|----------------|-----|-------------|--------|-------------------|
| 1     | Regression | 18.754         | 3   | 6.251       | 15.627 | .000 <sup>b</sup> |
|       | Residual   | 40.404         | 101 | .400        |        |                   |
|       | Total      | 59.158         | 104 |             |        |                   |

From table the study findings revealed that all coefficient of study variables were all positively significant to be used for multiple regression as predicted by; route delivery speed ( $\beta_2=0.489$ ,  $p<0.05$ ). This give an implication that a unit increase in route operation cost caused a 0.179 increase in performance of Dola Company, a unit increase in

route delivery speed caused a 0.489 increase in performance of Dola Company .This was illustrated in equation 4.1;

$$Y = 1.417 + 0.489X_2 + \dots \text{Equ. 4.1}$$

This can be as translated as follows

$$\text{Firm Performance} = 1.417 + 0.489 + \dots \text{Equ. 4.2}$$

**Table 4.12 Coefficients of Route delivery speed on Firm Performance**

| Model                | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig. |
|----------------------|-----------------------------|------------|---------------------------|-------|------|
|                      | B                           | Std. Error | Beta                      |       |      |
| 1 (Constant)         | 1.417                       | .536       |                           | 2.643 | .010 |
| Route Delivery speed | .366                        | .062       | .489                      | 5.938 | .000 |

This study tested the three hypotheses using the multiple regression models. The decision rule was based on p value where  $p<0.05$  lead to rejection of null hypotheses and when  $p>0.05$  leads to failing to reject the null hypothesis. The hypotheses test results are shown in table 4.15.

The null Hypothesis  $H_{02}$  indicated that there is no statistical significant effect of route delivery speed on firm performance of Eldoret Dola Manufacturers. However, the study finding indicated that route delivery speed has a positive and statistically significant effect on firm performance of Eldoret Dola Manufacturers ( $\beta=0.489$ ;  $p<0.05$ ). Thus, the study results rejected the null hypothesis. This implies that traffic congestion costs commuters, not taking into account things like deadlines, especially if your supply chain relies on trucks that are

#### **Summary, Conclusion and Recommendations** **Effects of Route Delivery Speed on Firm Performance of Supply Chain**

The study finding indicated that route delivery speed has a positive and statistically significant effect on firm performance of Eldoret Dola Manufacturers. Thus, the study results rejected the null hypothesis.

currently stuck in traffic. If commuters alone are wasting this much money in traffic, the cost of congestion for delivery truck is undoubtedly higher. These study findings agreed with study by Bushuev (2016) who indicated that optimally positioning the delivery window minimizes the expected penalty cost due to early and late delivery. The conditions for the optimal position of the delivery window are derived for the general form of a delivery time distribution. From the perspective of the buyer, untimely delivery can impact inventory holding and stock out costs. The study formulate the supply chain delivery window problem as a stochastic model with three possible delivery outcomes (early, on time, and late delivery) and integrate this feature with an inventory model with two levels of storages (owned warehouse and rented warehouse).

The study findings also showed that majority of respondents agreed that operational cycle time enhances the delivery speed of products to customers, expected traffic congestion on chosen route may slow the delivery speed of products, chosen route ensures on time delivery of goods to customer and lastly the study results revealed that

majority of respondents agreed with the statement that life spend of the product determine the delivery speed to the customers.

### Conclusions

The study concluded that expected traffic congestion on chosen route may slow the delivery speed of products. Traffic congestion costs commuters, not taking into account things like deadlines, especially if your supply chain relies on trucks that are

currently stuck in traffic. If commuters alone are wasting this much money in traffic, the cost of congestion for delivery truck is undoubtedly higher.

### Recommendations

The company should plan for the shortest route since using the shortest route reduces the cost of fuel and also accommodates customer's short notice requirements and therefore route availability, and vehicle issues, route planning has to be able to quickly respond to any event to ensure the lowest cost of transportation.

The company should find a way of reducing traffic congestion on chosen route since it lowers the delivery speed of products.

The study recommends that use of theory of constraints because the theory is a methodology for identifying the most important limiting factor (for example . constraint) that stands in the way of achieving best route planning in the firm and then systematically identifying and eliminating the constraint towards enhancing performance. The route planning identifies the constraints some of the constraints to include inefficiencies and injuries. The route planning management system gives a company the benefits of lower costs, increased efficiencies, fewer injuries, maximum sustainable returns on operating assets, and an enhanced competitive position (Jeronimo, Antunes & Filho, 2016).

### Suggestion for Further Researchers

Recommendation for further researchers is that they should research on other organizations apart from Dola manufacturers limited in order to get wider scope of effect of supply route planning on firm performance. They should also research on ways of reducing traffic congestion on chosen route since it lowers the delivery speed of products.

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